# ABSTRACT OF THE DISCLOSURE

A novel compression method uses bitmaps to reduce the memory storage requirement of routing table information to about 3 MB. The data structure can be used for both route lookup and update. It does not require a separate data structure to be used for route update. A fast route lookup method is also disclosed. An efficient update method supports incremental route update. Through configuring a processor properly and developing a few customized instructions specifically for route lookup, the system can achieve more than 10 million lookups per second (MLPS) at 200 MHz. Using a configurable processor for route lookup/update provides more flexibility and extensibility which supports different data structures and lookup/update methods to meet application specific needs. The data structure and lookup method can be implemented in pure hardware in a pipelined fashion to achieve approximately 100 MLPS.